AMERICAN
GAS JOURNAL
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VOL. 123. No. 24
WHOLE NO. 2368

NEW YORK, SATURDAY, DEC. 12, 1925

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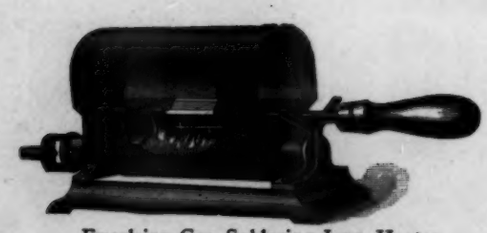

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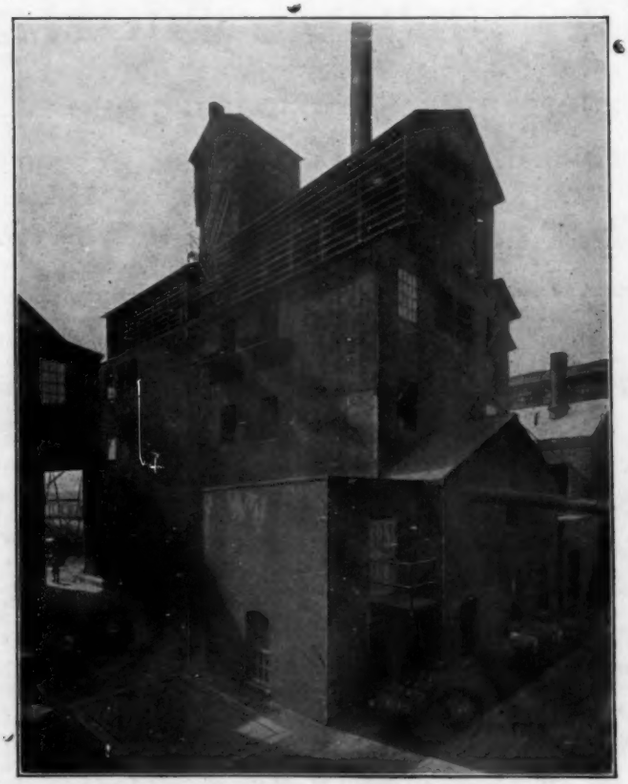

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Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. & Treas. C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

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Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, Dec. 12. 1925. Vol. 123. No. 28.
Published weekly by American Gas Light Journal, Inc., New York, N. Y.
Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Vol. 123. No. 28 NEW YORK, DEC. 12, 1925 Whole No. 3554

A Guide for House Heating Salesmen

Details of one particular sale and results

Henry L. Nickerson

Blackstone Valley Gas & Electric Co., Woonsocket, R. I.

STARTING in the natural gas regions, where gas was the cheapest fuel, the many advantages of gas house heating were so well demonstrated that heating homes with gas has grown in favor until now, in conservative old New England, where the winters are long and cold and gas is usually more expensive than other fuels, we find the gas-fired boiler becoming more and more popular because gas is the best heating agent. Just as anthracite coal a hundred years or so ago slowly gained headway until it eventually became the principal house heating fuel, we, today, can see gas gaining ground, with the prospect that in the future it will become the fuel which all New England householders who can get it will use.

During the last two or three years great strides have been made. In Pawtucket, Woonsocket, Haverhill and Fall River a total of more than 130 installations have been made, and by the end of the year 1925 over 250 boilers will be in operation in the territory composed of these cities and the outlying communities they serve.

Wide Success Gained in New England

Many other New England gas companies have done a great deal of successful work with gas-fired, house-heating boilers. Some companies are now placing four or five boilers in the homes of friends of the company that they may watch the results and gather data before undertaking to develop a large house heating load. It is surely only a matter of a short time before every gas company in this section of the United States will be developing gas house heating with a great deal of earnestness.

Outside of New England, companies such as those in Baltimore, Denver, St. Louis and Portland, Oregon, which have been developing this phase of the gas business strenuously, now have hundreds of gas-fired house-heating boiler installations. It may be stated without reservation that the experimental stage has been passed and that now it is merely a matter of getting the business.

Work Divided Into Three Parts

The work of the gas house heating engineer may be divided into three parts. First, he must sell, that is, he must close the contracts for the installations. Second, he must direct the installations, in order that each and every boiler be installed in such a manner that it will give the utmost in satisfaction. Third, he must give attention to the maintenance of the installation toward the end that it give such perfect satisfaction in service that the owner would never think of going back to any other kind of fuel. Doing these three things includes a lot of little jobs not mentioned in detail, but which are important, and which fall under one or more of these three divisions.

Just as the first thing to do when making rabbit stew is to catch the rabbit, so the first thing to do when selling gas house heating is to find the prospect. A good way to do this is to look up every man whom you think has an income of $4,000 or more a year. Professional and traveling men are often the best prospects.

We have sold boilers to men having incomes less than $4,000 a year, but the man having an income of around $5,000 or more a year is really a better prospect. Selling the first installations in the town to men who are well known, have considerable influence and possess a good deal of wealth serves to add prestige to gas house heating.

Man Who Can Afford Best Prospect

The best prospect is the man who can afford to pay for the service, comfort, convenience and clean-

liness that automatically comes with heating with gas. In New England we have found that this means the man with an income of $5,000 or more a year.

Some of these men now have oil burners, but that may make them even better prospects than they would have been had they been burning coal. We have found that about 50 per cent of the oil burner users are a considerable distance from being entirely satisfied. The noise of the motor, the odor of oil, and the carbonizing of the inside of the boiler are annoyances. If there has been an interruption of the electrical service during a cold day, that much more has been added to the dissatisfaction. The window sills in many oil-heated homes are always black and greasy from the particles of soot that come out of the chimney. Oil burners have a short life, continuing to give service for only about five years, and there is always the probability of an advance in the price of oil. These are only a few of the objections people find in oil. The very fact, however, that a man is using an oil burner shows he is looking for a fuel more satisfactory than coal, and if he is not satisfied with oil he is certainly an excellent prospect for gas, the perfect fuel.

Do Not Knock a Competitor

I do not recommend bringing up the subject of oil unless the prospect talks about it first. Nothing boosts a competitive article more than a knock. However, it is well to know the shortcomings of oil so that one can feature those qualities of gas which stand out most strongly in contrast. Oil does not need to be mentioned. The prospect already knows the failings of oil far better than he can be told.

Coal has not a single advantage over gas, if we do not consider fuel cost alone. Even this advantage of cost is often more apparent than real, for under certain circumstances the total cost of gas heating may be materially below that of coal heating.

Better to bring out the different points involved in selling gas house heating, let us take up the details of a sale made to one of the hardest to convince prospects with whom I have ever had business dealings. I found this man by seeing his fine home in the best residential section of the city.

An Example of a Sale

After looking him up in the directory I called on him. The first call is perhaps the most difficult part of selling gas house heating, because you cannot give any definite costs on installation or operation. The best you can do is to try to get the prospect interested by telling him of the good results some friends of his have had, speak about the cleanliness, lavor saving, uniformity of temperature with the amount of heat under constant control, and arouse his interest to the point where permission is gained to measure his house.

This prospect showed no interest at first and would give no reason for this lack of interest. It is very hard to deal with a man of this sort. He makes it about as discouraging as trying to dig a hole through a two-foot concrete wall with a penknife. You can't see that you are making any progress. He readily agrees to everything said, yet fails to be interested, and this armor of indifference seems to blunt the edge of every argument. At last, however, he did consent to let me measure the house, though assuring me he was not interested in the least in the proposition and making up estimates would be a complete waste of time on my part.

Measuring the House

Next day I did the measuring. It is a two-story house, facing west, without a great deal of exposure in any direction. There are five rooms on the first floor and four rooms and bath on the second. Two of the rooms are built out from the rest of the house, so as to serve as sun porches, and windows run around three sides of them, making a large glass area compared to the size of the rooms.

I found the house heated with a one-pipe steam system, supplied from a steam boiler in the cellar. About 14 tons of coal were being used per season and a man was paid $3.50 a week to do the firing. It was apparent that the cost of gas would at the most not be very much higher than the total then paid for fuel and labor.

Making a thorough inspection of the piping, I found the return pipe tilted upward, making a water pocket at the ell. I also saw that if he changed this pipe, connecting to the bottom of the boiler instead of the supply, results would be very much better. It pays to inspect the piping with the greatest care, because things that are found to be wrong can generally be used to advantage in your sales talk.

Figuring the Radiation

After figuring up the radiation by the Stone & Webster modified 2-20-200 rule, I found a total of 334 square feet of theoretical radiation was required. The actual radiation being used was 313 square feet. The air volume was 14,600 cubic feet. Generally we don't find the actual and the theoretical radiations so close, and if the house is very much under-radiated, we tell the prospect so he can change it if he desires to do so.

With the radiation figured, we find the boiler size by adding on 25 per cent for mains and risers and another 25 per cent for quick starting. Multiplying 334 by 125 per cent gives 417.5 and multiplying this result by 125 per cent gives 521.825 square feet of radiation required. The nearest Bryant boiler had a rating of 560 square feet; so this was the size selected for the job.

(Continued on page 638)

The Quality of Gas

Principles on which the value of gas may be judged

Dr. Karl Bunte

(The interesting article which follows, and which has been taken from Das Gas und Wasserfach, 1925, pages 587 ff., is concerned with a subject which is of great importance to the gas industry in all countries. It relates to the principles on which the quality, that is, the real quality, of a manufactured gas can be judged. If it is clear just what ingredients and just how much of them determine the quality of a gas, taking into consideration, of course, the price of the product, then it follows that the proper steps can be taken to develop a process which will give such a gas with just such ingredients and in such proportions. The original article is a very lengthy affair and this translation has been accordingly considerably abstracted. The reader is referred to the German journal for the complete article, which has invoked considerable discussion in Germany and which contains the personal views of the author, Dr. Bunte, on this important subject.—Trans.)

IN any field the best means for judging the value of a manufactured product are the quality and the price of the article. The quality of manufactured gas is by no means synonymous with the heating value of the fuel and neither is the heating value of the gas the preponderant factor in determining its quality. Perhaps it may be stated that the uniformity of composition of the gas, because of the many chemical and physical influences that it has to undergo in its use in various carefully controlled industrial and domestic purposes, is the determinative factor in fixing its quality.

What Manufacturing Process to Use for Gas Making

The question that arises is, just what process should be employed in the manufacture of gas, on which a new gas structure can be built. In the first place, it is necessary to study the various gases and gaseous mixtures which are suitable for producing heat. The number of typical gases of heat value is not large. They are methane, hydrogen and carbon monoxide.

The vapors obtained from hydrocarbons are to be considered as heating gases only in an incidental way and only in so far as other more important uses are not found for them in the industrial field.

In attacking this problem the engineer who interests himself in gas making will undoubtedly give due consideration to the fact that the gas obtained from coke ovens used in making metallurgical coke contains between 50 and 60 per cent of hydrogen, between 25 and 30 per cent of methane and between 8 to 10 per cent of carbon monoxide.

Gas from Lignite Coal

(The author at this point goes into a discussion of the various gases that are produced in Germany in various localities, and these are only partially interesting to us. Mention is made of the gas that is made from the carbonization of lignite coal. In discussing this gas, Dr. Bunte states that it is of low heating value, containing about 50 per cent of carbon dioxide and sulphuretted hydrogen, and its heating value is approximately 3,000 calories per cubic meter. It also possesses a high specific weight. If it would be possible to remove the carbon dioxide and the sulphuretted hydrogen by a commercial process, then the heating value of the gas would be increased to 6,000 calories per cubic meter. The removal of the carbon dioxide and the sulphuretted hydrogen cannot be accomplished with the aid of limestone and the most practical method seems to be to wash out these gases under high pressure. This would necessitate bringing the pressure of the gas up to eight to ten atmospheres and using about 1,000 litres of water at this and higher pressures per cubic meter of the raw gas. This would naturally entail considerable expense and it can hardly be expected that a valuable gas of reasonable cost could be made in this manner.)

In connection with the production of oil and other liquid fuels, a matter which is agitating the technical circles of the entire world at the present time, mention must be made of the shale oil process and the Bergin coal liquefaction process as having some relationship with the determination of the future universal gas-making process.

Shale Oil Distillation

As far as shale oil distillation is concerned, it is possible to obtain a gas from the process which can be admixed with water gas and then employed as a fuel. It is the opinion of the writer that the conditions that apply to the generation of gas from shale are similar to those that pertain to the manufacture of gas from lignite. Of course, even in Germany the status of this phase of gas manufacture is still undecided and there is not any great quantity of gas that is being made in this manner.

The Bergin Process

An interesting process, which is comparatively new, is the Bergin process, and this deserves some consideration here. According to this process, the coal is directly converted into oils by the action of hydrogen gas. For this purpose coarsely ground coal, whose quality is not of any great significance, is made into a paste with the aid of the oil that is obtained from another part of the process. A few per cent of iron oxide are added for the purpose of combining with the surplus present in the coal. The paste is then pressed into the proper shape in apparatus which is specially designed for the purpose and while in this apparatus it is subjected to the

action of hydrogen at a temperature of approximately 400 to 450 degrees C. and at a pressure of 100 to 150 atmospheres. About 70 to 90 per cent of hydrogen is employed. The coal is thus converted for the most part into the liquid form.

About 15 to 25 per cent of the coal remains unchanged. The oil yield is approximately 40 to 60 per cent, of which about 25 to 40 per cent has the quality of U. S. Navy standard motor fuel. About 10 to 20 per cent is a Diesel oil, 5 to 15 per cent a lubricating oil and the remainder a heating oil. Half of the nitrogen originally present in the coal is recovered as ammonia gas. In addition to the oils, there are also formed gaseous mixtures containing methane and ethane and these, mixed with the hydrogen that is not consumed in the process, yield a gas which has a heating value of 5,000 to 6,000 calories per cubic meter. The reaction mass that is emptied out of the high pressure cylinders is cooled by coming in contact with a counter-current

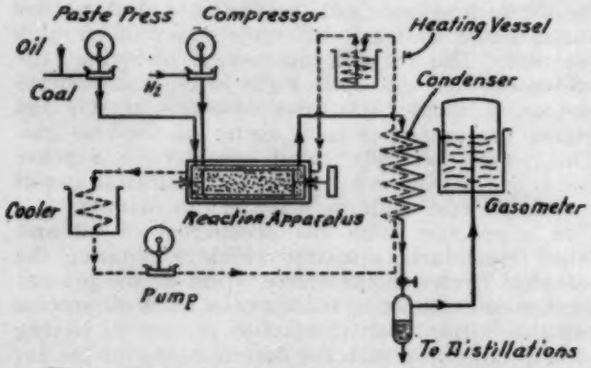


Fig 1. Diagrammatic Sketch of Bergin Process

of heating gas and is thus separated into the various gases, liquid and solid products.

Connection of Process with the Gas Industry

The idea has been proposed to connect this process with the manufacture of gas. This idea depends on the fact that at times, in fact, during half of the process, reaction gases of high calorific power, which are used for the manufacture of the hydrogen required in the manufacture of the oils, and which are derived in accordance with the equation $CH_4 + 2H_2O = CO_2 + 4H_2$, are available. The formation of hydrogen is accordingly accomplished by the decomposition of methane with the aid of water vapor. After the carbon dioxide content of the mixed gas has been washed out, the remaining hydrogen is of sufficient purity to be used in this process. The remainder of the reaction gases can be used for heating purposes.

Use of Mixture as City Gas

It would, therefore, seem to be possible to employ the mixture of hydrogen and methane as city gas, and in place of the hydrogen, obtained from the decomposition of the methane, to employ for this purpose the hydrogen that can be derived from water gas. Furthermore, when the high calorific value reaction gases, which are quite heavy, are mixed with hydrogen in the plate of water gas, a gaseous mixture is obtained which would be very much like a normal city gas as far as heating value and specific gravity are concerned. Thus, by combining the Bergin process with the processes that are employed in the gas works, from a total of 3,100 kilograms of coal there would be obtained approximately 1,500 cubic meters of city gas of 4,500 calories per cubic meter calorific power, 450 kilograms of oil, 100 kilograms of gas works tar, 25 kilograms of ammonia and 260 kilograms of low-grade coke, consisting mostly of coke breeze. In other words, in place of 1.7 tons of coke which would normally be obtained with 1,500 cubic meters of gas, there would be secured instead 450 kilograms of oil.

Applying Bergin Process to Gas Making

This matter is of much interest, even though it may be purely academic at the present time, that the author has given the following diagrammatic representation of the relationship between the various factors in the Bergin process and in the ordinary gas-making process. This is shown in figure 2. It is seen that the diagrammatic representation applies to a gas works in which only 4,350 kilograms of coal has to be put through the process in order to produce the various quantities of materials that are set forth.

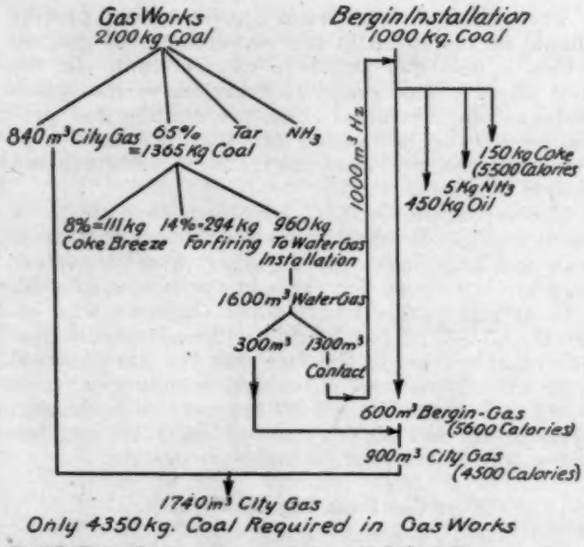


FIG. 2. The Connection of the Bergin Process with Gas Machine

(In further development of his argument on the trend to be taken in the manufacture of gas in the future, the author states that, as the demand for gas increases and its production increases, so will the production of coke increase and, as that increases, it stands to reason that it is necessary for the demand for coke to increase at the same time in order

(Continued on page 642)

The Industrial Survey *

What it signifies and two examples of actual surveys

R. E. Ramsay

AT the first meeting of the managing committee of the Industrial Section of the A. G. A., held last November, it was pointed out by the chairman of the section that before deciding on the activities to be undertaken by the section all the members should agree that the ultimate goal of each member should be to aid in bringing about the general use of gas as a fuel for industrial applications.

It was pointed out that economic considerations, together with inherent qualities of gas as a fuel, support the belief that gas will be the ultimate fuel in industrial heating operations.

It appeared that before any definite program for the promotion of industrial gas sales could be placed before the officials of any gas company, it would be necessary to point out to them the possible fields of development or potential cutsomers in their territory. To do this it would require a complete survey of the industries in such territory.

A Plan for Industrial Surveys

It, therefore, was decided to appoint a Survey Committee whose work would be first to develop a plan for making industrial surveys, and second to present supporting data to show gas company officials the value and the necessity for such a survey.

To properly develop any line of business it is necessary to first know the possibilities of that particular business. This is as true in the industrial gas field as in any other. A survey of the potential business is a necessary starting point and an important fundamental upon which to build.

Many gas companies feel that they know the prospects and potentialities of their territory, yet on the carrying out of a systematic survey they find many new fields and opportunities disclosed for the ultization of their product.

Scope of an Industrial Survey

An industrial survey should be made of the heating operations in the territory served by every gas company, dividing the available business that could be secured into two general classes:

1. The business in those industries where gas fuel is better adapted than competing fuels, as the operations are of such character that they would require automatic control and operation. It is thought that this business offers the greatest opportunity for immediate sales of industrial gas, and, therefore, should be first considered.

2. A complete survey of every heating operation should be made, conducting tests and compiling all the information that can be obtained which has a bearing on or is incident to the use of any competing fuel and the fuel costs of production.

*Delivered at the Tuesday meeting of the Industrial Section, A. G. A. Convention, Atlantic City, N. J., October 13, 1925.

What Is Involved

It, therefore, is obvious that the proper survey should be one which would involve going into each industry in the territory served by the gas company, making a thorough study of each individual heating operation, obtaining present fuel requirements, production output, labor costs, spoilage, fuel and various other items which enter into the ultimate cost of producing the products in these industries.

It is not only necessary to gather this information, but the information gathered must be analyzed by those who are familiar with the industries in which the survey is made, that proper recommendations can be made for the type of gas equipment to furnish, and its comparative operating costs with competing fuels.

Object of Survey

The object of the industrial gas survey is primarily to stimulate additional sales of industrial gas and should be designed to point out three things about this industrial business:

1. Where we can sell the gas.
2. When we can sell the gas.
3. How we can sell the gas.

It is evident that the determination of these three things will entail more than a casual investigation of our potential markets. It is essential that we know who our potential customers are, when these potential customers will become customers and how the business is going to be secured.

Value of the Survey to the Gas Company

With a complete survey of all the industries of each territory served by any gas company grouped into one report showing the present costs of performing the various operations in the different industries, and the cost of carrying on these same operations with gas as a fuel, if the facts are at all favorable to the use of gas under existing rates, there would be little difficulty in persuading that particular plant to use gas as a fuel.

If existing rates are not low enough, the survey should show what rate per thousand cubic feet is necessary to obtain the business, which information would be invaluable in determining the proper rate structure necessary to put in effect.

The value of the survey to the gas company may be summarized as follows:

1. It should show exactly what business could be secured immediately with the conditions under which that gas company now operates, and that business which could be secured with the proper gas rates.

2. It places before the gas company a picture of the potential possibilities in their territory depending on such factors as rates, fuel oil prices, etc., and

provides a means for budgeting for future plant and distribution expenditures.

3. The complete record of costs of the use of present fuels in the various industries will serve to protect business secured by the use of gas and aid in keeping those industries sold on gas.

The Value of the Survey to the Potential Industrial Gas Customer

Manufactured gas cannot compete at the present time with other fuels such as coke, coal and oil on a price of strictly B.t.u. basis.

Therefore, the only means of securing the industrial load is a complete study of present fuel costs in industries, familiarizing ourselves so thoroughly with that industry's methods and production costs that the difference in fuel costs between the utilization of gas as a fuel as against competing fuels can be made up due to the advantages inherent in gas to improve the method of manufacture. Therefore, the value of the survey to the potential industrial gas customer is:

1. It gives the industry accurate information on every detail in the manufacture of their product where heating applications are necessary.
2. It provides a basis for modernizing all processes directly and indirectly connected with the heating operations such as method of handling work, automatic operation and accurate temperature controls.
3. It will give them information on manufacturing costs and eliminate many wastes in production processes.
4. The industry becomes familiar with the latest type of gas equipment and heating methods employed on operations similar to their own in other industries where efficient gas equipment is now installed.

A Proposed Survey

In order to present a picture of the potential industrial business not now secured by the gas utilities and to appreciate the wonderful possibilities this industrial gas load offers, it was proposed that surveys be made of the industries in cities supplied with manufactured gas in the states of New York and New Jersey.

The committee was divided into three sections, and the work allocated as follows:

1. A general committee to outline the form the survey should take and to compile the data furnished by the other two committees.
2. A committee to secure the information in the State of New York.
3. A committee to secure the information in the State of New Jersey.

The Survey

It has been clearly and definitely defined in the preceding part of this report the reasons for the object and the value of each survey to the gas companies and to industries.

In representing the data in the State of New York, 18 cities were selected, the total gas sales for these companies for the year 1924 amounted to approximately 85 per cent of the entire gas sold by the 72 gas companies furnishing gas to communities in this State, excluding sales of those companies supplying the cities of Buffalo and Greater New York. The last two cities were not included in the survey as the work entailed in making surveys in these cities could not be accomplished in the time allotted to this year's committee work. Furthermore, these companies and territories are so large that they would not be representative of other situations throughout the country.

In the State of New Jersey cities were selected whose total gas sales for the year 1924 represented 82 per cent of the entire manufactured gas sold in the entire State for that year.

Questionnaires were prepared which would give the necessary data and sent out to the various gas companies selected in the two states.

Character of Questionnaires

The questionnaires and instructions for securing the data were so prepared that they would show:

1. The gas sales, revenues and operating revenue per thousand cubic feet for the calendar year 1924, dividing domestic and industrial sales, also giving the percentage of sales and revenue for each class of business.
2. A segregation of the present industrial gas sales in thousand cubic feet and revenue for the year 1924 divided into nine distinct classifications of industries, as follows:
   (a) Bakeries.
   (b) Foodstuffs.
   (c) Foundries.
   (d) Glass and ceramics.
   (e) Hotels, clubs, restaurants and institutions.
   (f) Machinery manufacturers.
   (g) Newspapers, printers and publishers.
   (h) Textile and clothing manufacturers.
   (i) Miscellaneous industries.
3. The information required from every industry survey showing present fuels used, the estimated gas consumption to displace competing fuels regardless of whether the business could be secured on present gas rates now in effect and the rate per thousand cubic feet necessary to secure the business.
4. The instructions for the survey pointed out briefly the method used in securing the information for these questionnaires, and the benefit that the company would secure from the compilation of the data.

The cities to be covered were widely scattered and it was agreed after due consideration to forego the compilation of the data secured in this State, as the information was not sufficient detail to present the survey in its entirety.

The Case of Syracuse

However, in one of the cities selected, Syracuse, N. Y., an extensive survey was made, and the results of this survey are shown to depict the status of the possibilities for the sale of industrial gas, which to some extent must apply in other cities

throughout this State and in many sections of the entire country.

For the year 1924 the industrial gas sales in Syracuse were 363,000 M. cu. ft., equal to 25.18 per cent of the total gas sales, and 23.73 per cent of the total revenue.

The gas rates then in effect were from $1.13 per M. cu. ft. for the last 20 M. cu. ft. of gas used monthly to 65 cents per M. cu. ft. for all gas used over 3,000 M. cu. ft. per month.

New Jersey Survey

The work of the Survey Committee in the State of New Jersey was confined to the 24 districts supplied with the gas by the Public Service Corporation of New Jersey as the gas sold by these districts represents the industrial sections of the State with gas sales aggregating 82 per cent of the entire gas sold in the State of New Jersey. Further, the supporting data was in such shape that it could more easily be compiled.

Of total gas sales of 19,857,000 M. cu. ft. of all the cities for the year 1924, only 13.77 per cent, or 2,734,000 M. cu. ft. were sold for industrial purposes. However, this percentage of sales was secured with an average rate of $1.078 per M. cu. ft., or a rate approximately 13.9 per cent lower than the average rate secured from sales to domestic customers.

A total estimated available business of 33,864,000 M. cu. ft., equal to approximately one and three-fourths times the entire gas sold by these districts for the year 1924, was indicated.

The above figures on the various situations supplying gas in the State of New Jersey not only show the present industrial load with its relation to total gas sales for revenues, but also furnish these companies with the potential possibilities offered for the sales of additional industrial gas business.

It is only by the method of survey as outlined and which should be conducted by every gas company that we can expect to have complete information of the present status of the industrial business and its future possibilities.

Conclusion

In this report on industrial gas surveys we have attempted to point out the reasons for making such a survey, its value to the gas company and to the prospective industry and to indicate in a general way the type of survey that should be undertaken.

The subject presented is so large that it was not possible for the committee to follow its work to definite conclusions, in all of the work originally planned.

There is little doubt but what most progressive gas companies have made what is termed a survey. Most of these surveys, however, merely point out that certain industries in their territory served are using oil or other fuels at certain prices for different operations, and are not followed further to be assured that the business could be secured at a profit with a possible change in gas rates.

A complete survey conducted along definite lines should show the investments in plant and distribution systems and whether the contemplated business would show a profit at the rate it would be necessary to make to secure the business.

Who Will Make Survey?

We have shown how the survey should be conducted, but no mention has been made as to who will make the survey.

For some of the very large gas companies the survey could be made by their industrial men, with the co-operation of the various manufacturers of industrial gas equipment.

In the smaller company it is probable that, while an industrial man's services are employed he would not be capable of making a complete analysis of each operation and recommending the equipment which would be best suited for the use of gas.

It would seem that some way must be provided for the smaller companies that they are assured of securing all the necessary information; it, therefore, is suggested by this committee that this could be done in two ways:

1. That the American Gas Association undertake to maintain a corps of engineers whose services would be loaned to the various gas companies on the basis of so much per day and expenses, or
2. That the manufacturers of industrial gas equipment furnish these engineers on the same basis of so much per day and expenses.

The main thing is that a complete survey should be made, and, if properly conducted, based on facts, every company will have a complete budget of the industrial possibilities of the territory it serves.

(This is an abstract of the original report which includes detailed tables showing results obtained in the New York and New Jersey surveys. The complete report will be found in the Proceedings of the American Gas Association.—Edit.)

GAS REPLACES KEROSENE IN SINGEING HOGS AT CHICAGO STOCK YARDS

The desire of a Chicago packer to produce a thoroughly cleaned and singed hog, with a minimum of labor, has led to the development of a gas-fired singer to insure the removal of all hair.

After passing through the scalding tank, which removes most of the hair, the hogs are carried on an overhead conveyor, different operations being performed as it passes the men. Formerly three men with kerosene torches singed the hog before it reached the men, about 25 in number, who scraped and shaved off any hair that remained. However, it was impossible to rid the hog of all the hair and the frequent spilling of the kerosene gave the meat a bad taste.

To remedy this situation a gas-fired singer was built. Built in two U-shape sections, it completely surrounds the hog as it passes through. The bottom burner is regulated up or down to accommodate short or long hogs and thus a thoroughly singed, clean hog arrives at the far end of the conveyor.

Advertising Builds Good Will*

How the newspapers can help utilities serve the public

Thomas H. Moore

Associate Director, Bureau of Advertising, American Newspaper Publishers Association

SCRAPPING old machines for new and better ones is an American habit. An American engineer once went to Great Britain to rebuild a railway system. After he studied things over a little, he said: "What London needs is to learn the value of a scrap pile."

Your engineer does not hesitate to spend thousands on a new machine if the new machine will do the work better. He knows it will soon pay for itself.

Apply the same idea to your selling methods. Scrap the old methods. Put in the newest and best there is—and that is a rightly planned newspaper campaign. Money put into such a newspaper campaign will bring back new revenue just as certainly as the new machine will. This is not theory; it is a hard fact that every department store man in your city knows.

Advertising Just Beginning to Be Understood

The utility companies, like our great financial interests, have only begun to understand advertising within the last few years. They have gone far enough to know how well it pays. Looking back over the year 1924, I would estimate that the utility interests spent $11,000,000 in advertising. That seems like a great deal of money, but when you check up and find that the investment in our public utilities alone is pretty nearly large enough to pay the national debt, expenditures look rather trifling.

Rightly done, there is even a bigger thing newspaper advertising will do for the public utility. It will build that asset Mr. Sloan rates as the biggest asset of the Brooklyn Edison Company—public confidence. It will take you out of the hands of the self-seeking politician and the demagogue. It will help make friends of your customers. It will make people praise your successes and forget your mistakes.

I know that many of you gentlemen use newspaper advertising to sell merchandise. Some of you have found out that it has paid. When the merchandise man looks on advertising, his finding is pretty much like the small boy who wrote this definition of salt: "Salt is what makes potatoes taste bad when you don't put any in."

A merchant is pretty apt to subscribe to the theory that newspaper advertising is what makes business bad if you don't do any.

A Doubt Created

Failing to tell the public frequently creates a doubt. Doubts are hurtful. "Tell and Save Hell" might be a good slogan for a utility man.

In passing, it might be well to point out how the department store has blazed the way for big and constant use of newspaper space. The department store's success is due to its close contact with the public. The voice of that contact is newspaper advertising.

The department store experts have worked newspaper advertising costs and advertising results out to a definite scientific basis. The store knows that it pays to spend from 2½ to 5 per cent of its gross receipts for advertising. Saying "knows it pays to spend" sounds queer. But the store is sure. It is just as sure that its advertising is going to pay as your engineer is sure when he spends millions of dollars scrapping old machinery and buying new. Newspaper advertising pays the store because it brings the volume up to a point that cuts down the ratio of other expenses.

Utility Industry Developing

The world is moving rapidly. The big things of today are the junk of yesterday. The utility map is changing. Gas that was the illuminant of half a century ago is passing into the mysterious bourne from which no illuminant returns. But gas is striding forward to new uses. It is showing the housewife easier and better ways of cooking. It is joining with oil to give coal a battle royal in the industrial field. In a merchandising way, it is opening up and has still to open up a whole army of new customers.

If you look at the strides radio has made in the last five years, don't forget the newspapers and newspaper advertising have had a big part in this development. Fifty per cent of the radio business at this moment is centered within 150 miles of one city in the country, and that is the city where newspaper advertising has been to the fore first.

Pick up any of your newspapers today and you will find them crowded with radio advertising.

Broad Policies

In talking to a group like this, it is hard to keep from being involved in a mass of details. There are so many intimate and technical things I want to bring out, things that I know you are interested in, but with your permission I want to get away from the minutiae of advertising and of newspapers and talk simply of broad policies. In other words, I want to paint my little picture with broad brush strokes and not clutter it up with a multiplicity of lines. Those of you who make illustrations for

(Continued on page 646)

*Presented at the convention of the Empire State Gas and Electric Association, Lake Placid, N. Y.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 98

Combustion

UP to the present time Industrial Gas Lessons have been concerned with the physical aspects of heat. Description has been given of all the various phenomena concerned with heat and its movement from place to place, the measurement of heat effects, and the like. Nothing has been said regarding the manner in which heat is generated except to mention that there are different ways in which it can be produced. The task now before us is to consider the very important matter of generation of heat by combustion and the measurement of this heat in generated and in potential form, as well as in the burned fuel.

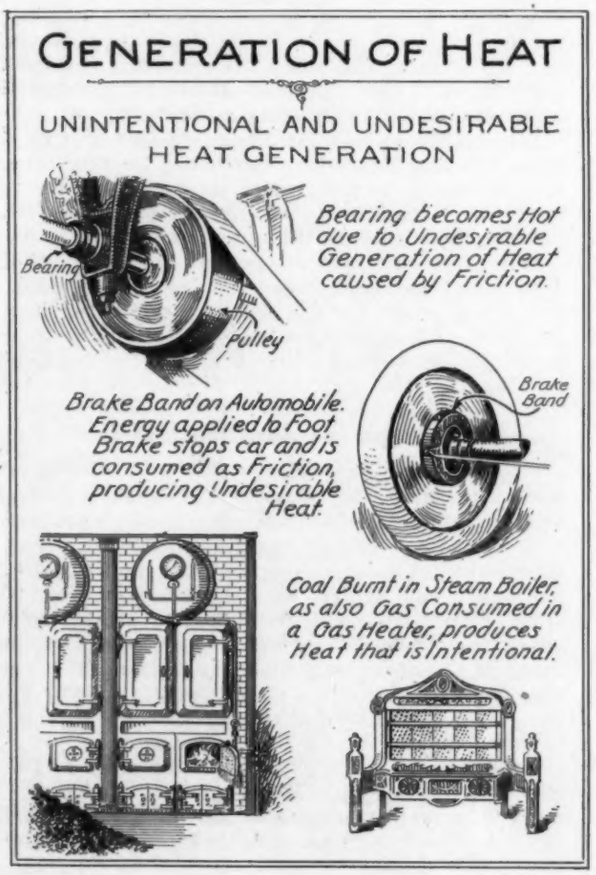
It has been pointed out that there are various ways in which heat is generated. It was first described very definitely that heat is a form of energy and that it is only possible to obtain heat by consuming some other form of energy. Sometimes this is done purposely and then, again, heat is generated as a by-product, it might be said, in the utilization of energy. Thus, friction is always productive of heat. This is the manner in which mechanical energy is converted into heat energy. When the automobilist applies the brakes to his car, he is translating the mechanical energy of motion into heat energy by means of the friction of the brakeband against the rotating drum on the wheel. When an engine operates or a motor turns, a certain amount of energy is unavoidably wasted by being converted into heat due to friction. The purpose of oiling is in part to reduce this loss of energy by reducing the frictional effect between the rubbing, sliding or rotating surfaces.

Heat Produced Intentionally

Contrary to this method of heat generation is the one which produces heat intentionally.

The production of heat intentionally, for the purpose of using the heat as such in various processes or for converting it into other forms of energy, is carried out almost exclusively by burning fuel in the process of combustion. Of course, a certain amount of heat is produced by electrical means, by allowing electricity to pass through a conductor which possesses high resistance, as, for example, nichrome wire, a wire made from an alloy of nickel and chromium. The heat is developed due to the fact that the high resistance of the wire causes it to heat up and a considerable thermal effect is produced in this manner. However, this method of developing heat is by no means an economical one, although, to be sure, it possesses characteristic advantages all its own.

It is thus important to differentiate between the two general methods of developing heat, namely, the intentional and the unintentional. The unintentional method is distinctly in the nature of a by-process. That is, one which takes place incidentally to some


GENERATION OF HEAT
UNINTENTIONAL AND UNDESIRABLE HEAT GENERATION
Bearing becomes Hot due to Undesirable Generation of Heat caused by Friction.
Bearing
Pulley
Brake Band on Automobile. Energy applied to Foot Brake stops car and is consumed as Friction, producing Undesirable Heat.
Brake Band
Coal Burnt in Steam Boiler, as also Gas Consumed in a Gas Heater, produces Heat that is Intentional.

other more important operation. Thus, in the example given above, the braking of the automobile is the principal process, one that has for its purpose the stopping of the car. Incidentally, of course, the action of braking, as transferred to the contact between the brakeband and the drum on the wheels, results in the generation of heat which, as is usual when heat is generated unintentionally, has a bad effect on the mechanism. The same condition is also true of the unintentional generation of heat in a bearing. This heat must be counteracted in some way or otherwise the bearing would be permanently injured. Here, again, the unintentional generation of heat has a bad effect on the mechanism.

The generation of heat intentionally, however, is accomplished by an entirely different process, although in this case, as the former, all that intrinsically takes place is the conversion of one form of energy into another. This chemical energy is converted into heat energy in the process of burning or electrical energy is converted into heat energy through the resistance of a wire or of the material itself that is being heated. We shall be concerned in the remainder of these lessons with the principles and practice of the generation of heat through the combustion of combustible matter.

A GUIDE FOR HOUSE HEATING SALESMEN

(Continued from page 629)

The Cubic Feet of Gas Required

Computing for the heating estimate, I multiplied 334 square feet by the average temperature rise of 35 degrees, allowing for an average of 66 degrees for 24 hours, then by 200 days, then by the factor 0.175. This constant 0.175 is the quantity of gas used per average degree difference between inside and outside temperature per square foot of theoretical radiation per heating day. We found this to be the average for our installations in Woonsocket and Pawtucket for the season of 1923-24. Completing the multiplication of 334x35x200x0.175 gives so close to 410,000 cubic feet, when the operation is done on the slide rule, that this was taken as the estimated consumption for the heating season.

With a boiler burning 320 cubic feet of gas per hour, the cost figured by our house heating rate is $315; however, as a factor of safety to care for any unforeseen conditions, we add 25 per cent. This made the quotation to this prospect $395.

With the estimates all figured and with all the data I had gathered about the installation then in use, I was ready for the second interview with the prospect. Much depends on this second call and usually it determines whether or not the boiler will be sold.

Featuring the Advantages of Gas

It has been my experience that it is wise always to impress upon the prospect the reliability of gas as a fuel, that it is always flowing through the mains regardless of weather conditions, that it gives a uniformity of heat throughout the house that he has never had before, that the temperature never varies more than one degree above or below that for which the thermostat is set, that there is never any firing of the boiler or the carrying out of ashes, and that there is absolutely no dirt, dust, soot or anything else of the kind sifting up through the house to make more work for the housewife.

I tell him of the safety of the appliance and this will probably lead him to ask what will happen if the pilot goes out. To ascertain for my own satisfaction I have purposely turned on the gas in a boiler rated at 400 cubic feet per hour and left it on for 15 minutes without lighting it. I could not detect a trace of gas in the cellar or any part of the house. I have found this demonstration convincing.

The Faulty Piping

When I brought up the point of the faulty piping, my prospect admitted he had heard a knocking sound in the piping and I told him what I had discovered. By the time I had covered all these points, he began to show real signs of interest and to reveal what his real objections to gas had been.

He asked about the safety of the installation and why a friend of his had received a bill for over $100 a month. The safety question was easily answered. To answer the second I explained that in buying coal he bought and paid for a winter's supply before the heating season started. After that he did not realize how much he used each month. He had no record of how much was used during the comparatively warm months of the fall and the spring or during the severely cold months in the middle of winter. I showed him how the total gas bill for the year is divided, that of the total about 19 per cent is paid for the gas used in December, about 21 per cent for January and 20 per cent for February.

Explaining High Bills

I find it is important to explain this to the prospect. It is better to have him afraid of the big bills he is going to get for the coldest winter months and be prepared for them than to be surprised when he receives the high bills. Impressing upon the prospects the fact that the coldest months mean big bills also tends to cause them to economize to some extent on the heat used during these cold months, for example, it causes them to pay more attention to keeping doors and windows closed, and this tends to make the bills lower. As a result, such prospects, after they have made the installation, will not come into the office with a complaint and tell their friends about the large bill they have had to pay for heating. The friend who hears of a high bill immediately multiplies it by six or seven, to arrive at the cost of house heating for a season. Therefore, unless the prospects are given all the in-

(Continued on page 645)

As The Journal Views It

A MUTUAL RESPONSIBILITY

In the history of public utilities there has always been prevalent the problem of public relations. The public utility serves the public and because of the peculiar character of the service it is granted what may be more or less of a regulated monopoly in its field. The public has seen fit to demand certain performances from the public utility in return for the quasi-monopolistic privileges accorded it.

In the past conditions have been such that neither the public nor the public utility gave sufficient attention to the question of the mutual responsibility of one to the other. The trouble lay as much with the people in general as with those who were responsible for the operation of public utility enterprises. Indeed, it was a state of affairs that reflected the general attitude of business toward the public, as well as of the public toward business. It was simply a condition dependent upon a state of mind prevalent in those days which made both parties concerned deeply suspicious of and unfriendly to each other. That this was unfortunate cannot be gainsaid, but that it has ceased to exist is something no one can deny and that all concerned are to be congratulated for.

Today there is more intelligent understanding of the problems of the public utilities and of their relations with the communities they serve. It is coming to be realized that the interests of both are irrevocably interrelated. If a public utility prospers, it is because it is giving adequate and satisfactory service, and it is a corrollary thereof that the community in which it exists is also prospering. We cannot find, as a general rule, except under conditions which are unfavorable toward the very existence of the utilities—we cannot find, we say—either a prosperous public utility in a non-prosperous community or a non-prosperous utility in a prosperous community.

For it is the public utility that determines, to a large extent, the prosperity of a community. The utility will not grow unless the community grows with it, and if the conditions are such as to indicate future growth it is the public utility that takes the initial step and prepares for this coming prosperity. It is almost certain that if it did not do so the growth of the community would be seriously hampered.

It therefore follows that the two have a mutual responsibility to each other. The public utility must give good service and it is anxious to do so at all times. On the other hand, the public must create conditions favorable to the aggrandizement of its public utilities, and it must take the proper steps to make the existence of the utility free from political ills. It must manifest a practical interest in the financial problems of the public service companies.

It cannot adopt an attitude that whether or not the street railway company or the gas company is successful in the customer ownership campaign is none of its affairs. It is decidedly the affair of every citizen in the community, for if these companies do not obtain funds with which to carry out their progressive plans, the greatest loser will be that very citizen. Public utilities, just like other business enterprises, cannot exist and grow unless their financial condition is good. And, we ask, who, after all, should be more interested in the financial condition of the public utility company than the very community which it serves and which it aids in its industrial and civic progress.

It is now true that public relations between communities and public utility companies are better than ever. It is true that the citizens are beginning to understand the real function of a public utility. It will, indeed, be a happy condition when both fully appreciate the mutual responsibility that they owe toward one another and forget their past difficulties, no matter what they might have been, and join their forces to the mutual benefit of both.

Stop, Look and Listen

What will be the ultimate effect of the time payment plan?

William H. Matlack

JOHN PUBLIC has a serious countenance these days. He wears the look caused by worry. His face is becoming lined and the frost is on his temples. Some say John's premature aging is chargeable to too much Time Payment. They say Liberal Payment Plans have him "doped," that he has taken too much of the stuff, that his whole system is saturated with it, and that he sees the low-down-payment in his sleep, that he is ever in fear of the clutching hand of the time payment collector.

Too much time payment is the cause of John Public's troubles. The flare-back is a troubled business condition that is affecting selling all over the country. While up to date there has been no collective action taken to curtail time payment sales, there has been and there is a lot of quiet discussion of the subject.

The Origin of the Plan

Selling on time for cash was originated to expedite the sale of certain larger units of merchandise—home appliances whose initial cost was so high as to be prohibitive to the average prospective user. It was devised to permit quantity production and to lift certain high-priced appliances out of a field where cash prices would restrict both sales and production.

The idea was feasible and the plans worked and consequently merchandisers in all fields devised a similar plan to run up their sales. Today some of the Public family dwell in homes purchased on this plan (and that is a proper use for such a plan), ride in a gasoline wagon, sleep in beds, eat off furniture, enjoy talking machines, radio and wear clothing and jewelry acquired by the time payment plan. They also heat water, cook meals and warm themselves with the aid of gas appliances purchased on the divided payment plan.

The "Carrying Charge"

Stupendous sums are paid by the Public family to bankers as a "carrying charge" on time payment purchases. The banker has to have insurance on the money he lends John Public, for in ninety cases out of a hundred he, for one, realizes that John is on a time payment spree and he takes no undue risks of any kind that carries no insurance. He is a good business man.

Now what's it all about, you may ask. The answer is just this: Quite a number of big business men over the country are questioning, "Is this time payment selling being overworked?"

Stop, look and listen! Glance at your appliance ledgers. Talk to your local merchants. Have a chat with the banker. Drop into the "Industrial" Loan Company. (This company will tell you what the money sharks are doing.) Consult the local and long distance moving company and give John the once over. Form your own conclusions. The matter is worth thinking about now, anyhow!

GAS BEATS GASOLINE FOR MOTOR TESTING

The same gas that burns in the kitchen stove and in the water heater is now being used by an increasing number of manufacturers instead of gasoline to test the wear in automobile motors.

Block testing and wearing in are essential to the operation of the finished car and it is found that for this purpose gas has numerous advantages. Where gasoline is used in testing rooms the atmosphere becomes highly charged with carbon monoxide. By the use of gas this danger is avoided. The use of gas also insures perfect combustion with no deposits of any kind in the motor cylinders, leaving the motor clean and ready for the service at the end of the test run.

In addition to these advantages it is estimated that tests made with gas costing $1.10 a thousand cubic feet are made at an expense that would be equivalent to the use of gasoline costing less than two and a half cents a gallon.

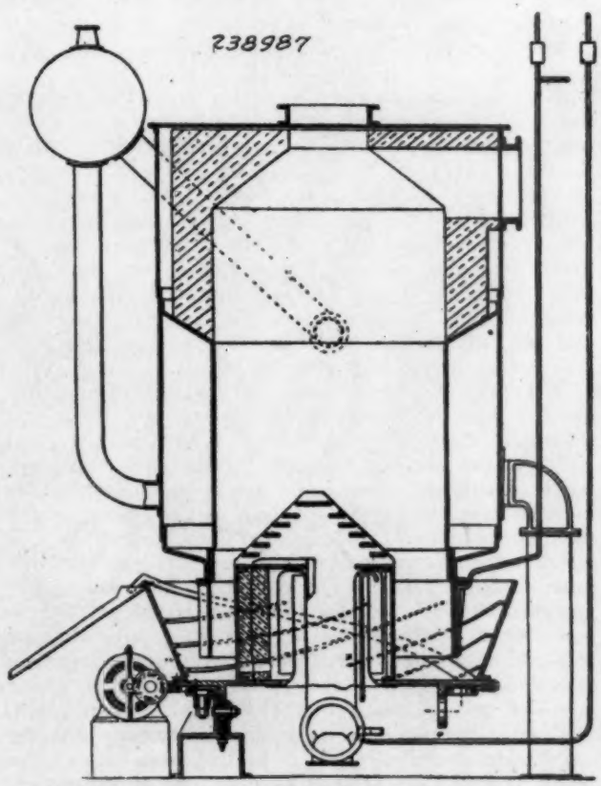
Seven of the larger automobile factories are now using more than twenty-five million cubic feet of manufactured gas for this purpose every month.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

SELF-CLINKERING AND SELF-STEAMING WATER GAS GENERATORS

THE object of this invention is to provide a safe and efficient self-clinkering and self-steaming water gas generator wherein there is no manual labor for barring down or clinkering, nor any loss of cooling water or of heat therein, while the means of automatically attaining these ends provides the generator with low-pressure steam suitable for the generation of the water gas, but not in excess of the requirements of the generator.

It has been determined, in the first place, that an annular metal vessel operating as a steam boiler can be utilized, in connection with a mechanical grate structure supporting a deep fuel bed, to prevent clinker from adhering to the walls of the generator or arching over the grate, and to cause the clinker and ash to travel evenly to the bottom of the fuel bed; secondly, that all the clinker and ash, instead of accumulating at the bottom of the fuel bed, can



be automatically and continuously discharged with low carbon content as they reach the bottom; and thirdly, that a water gas generator and safe low-pressure steam generator can be combined so that the steam space is never in contact with the fuel bed or blast or water gases, the production of steam does not exceed that needed for the generator (thus permitting the economic use of very low pressures), and the temperature of the top of the fuel bed is not reduced below that necessary for ready ignition of the issuing blast gases—all without any interference whatever with the efficiency of the automatic self-clinkering operations.

According to the present invention, there is embodied in the generator an annular water vessel surrounding the lower portion of the fuel bed, including the clinker adhesion zone—the height of which is easily found, being definitely determined by the character of the fuel in use, and the rates and times of blasting and steaming required for the efficient use of such fuel. The extent of the inner wall of the boiler above the clinker zone is so limited that the generation of steam does not exceed that required by the generator, and the heat of the upper portion of the fuel bed is not so reduced that the temperature of the issuing blast gases will be less than that required for ready ignition for utilization. The surface of the inner wall of the water vessel is set substantially vertical, and is free of any projections which would prevent descent of the clinker. The boiler, of which this vessel forms the heated water space, is provided with means for collecting the steam and conducting it to the generator in the required quantity and preferably at a low pressure; and the generator is provided with a mechanically actuated grate.—(British Patent No. 238,987.)

GASIFICATION OF COAL IN THE MEGUIN ROTARY VERTICAL FURNACE

FOR economical operation it is necessary to employ continuous furnaces of large capacity, from 500 to 1,000 tons per 24 hours. The rotary furnace of the type that has been used a long time in the cement industry fulfills this requirement. This type of furnace has been used in Germany for the distillation of coal, but it was found that certain difficulties connected with the composition of the coke make its use impracticable.

It is plain that the Meguin rotary vertical furnace overcomes these difficulties. This furnace is used for distilling coal at low temperatures. It is formed of a cylindrical sheet-iron shell, which is rapidly rotated, and, due to the centrifugal force, the coal is distributed in a regular layer over the entire surface of the cylinder. The heat softens the coal and as a result thereof it agglomerates under the pressure produced by the centrifugal force. In the interior of the cylinder there is a second one of slightly less diameter and concentric with the first. This second cylinder is provided with a spiral over its exterior surface.

The motion of the two cylinders is accomplished in a suitable manner by a system of gears, which are arranged in such a way that the speed of the rotation of the interior cylinder differs slightly from that of the exterior cylinder. Due to this fact the spiral on the interior cylinder effects the gradual movement of the coal from the top to the bottom of the apparatus. The cylinders themselves rotate in a fire-brick setting which forms the furnace, the latter is heated over its entire depth by means of properly placed gas burners.

The coke that is obtained from this furnace comes in quite large pieces. This is one advantage of the apparatus and another is that volatile products of carbonization are withdrawn from the apparatus in a direction which is opposite to that of the charging of the coal. This results in tarry vapors in the gas passing through a colder zone and indicates that decomposition cannot take place with resulting bad effects. It is plain that this condition pertains to the different types of rotating horizontal furnaces.

The type of coal which was treated in this furnace contained 9.5 per cent water, 16.2 per cent ash, 27.5 per cent volatile matter and 63 per cent fixed carbon and a minimum calorific power of 5,300 calories per kilogram.

From this coal there was obtained 73.3 per cent of the steam coke, 7 per cent coal tar, 6.6 per cent gas, 8.6 per cent water of distillation, 9.5 per cent hygroscopic water. For further details see original article in Zeits. Ver. Deutsch. Ing. 1925, volume 69, pages 564 to 565.

THE QUALITY OF GAS

(Continued from page 632)

to assure the economy of the process. On the other hand, there is the condition that, as the production of gas increases in a certain locality, the demand for coke is reasonably expected to decrease, for the reason that gas will take the place of coke in domestic house heating and in industrial furnaces. It therefore follows that there must be some sort of economic equilibrium between the required production of gas and the quantity of coke that is obtained in its manufacture.)

The Water Gas Process and Its Derived Forms

It appears very clear which of the two processes that are employed in the manufacture of a commercial gas from coke should be given the most importance. It is certainly not the air gas process which under the best conditions gives a gas which contains from 35 to 45 per cent of thermally valuable ingredients, the rest being merely nitrogen diluent. It is, of course, the water gas process.

In addition to the formation of water gas in the degasification space in the retorts or in the generators there are two other possible ways in which future development may take place. In the first place, there is the idea of a continuous water gas process or a process in which oxygen and steam will be used in the producer in the place of air, and then there is the conversion of the carbon monoxide of the water gas into methane.

In the first case, which deals with the oxygen producer process, or a continuous water gas process, it is, of course, necessary to have a source of cheap and plentiful oxygen. If such a source were available, then the process could be carried out with avoidance of losses in the hot blast, but with a certain consumption of power for the manufacture of oxygen, and there could be obtained a gas which would not be unlike water gas and which would be manufactured by leading a mixture of oxygen and steam in a continuous stream through coke. The gas would contain approximately 50 per cent of carbon monoxide in place of the usual 40 per cent, and approximately 40 per cent of hydrogen instead of 50 per cent.

Converting Carbon Monoxide Into Methane

The second process, which gives a mixture of methane and hydrogen, cannot be compared with the hydrogen-carbon monoxide mixture, in other words, water gas. Investigations have shown that when the proper conditions are maintained it is possible to convert a mixture of carbon monoxide and hydrogen into methane. The process takes place in accordance with the following equation:

$$CO + 3H_2 = CH_4 + H_2O.$$

And in place of one cubic meter of carbon monoxide with a heating value of 3,034 calories per cubic meter, and three cubic meters of hydrogen with a heating value of $3 \times 2{,}570$, or 7,710 calories per cubic meter, making a total of 10,744 calories per cubic meter of the gas, there are obtained one cubic meter of methane at a heating value of 8,562 calories per cubic meter. This simply means that only 79.7 per cent of the heating value of the original substance is retained after the process has been carried out, that is, 20 per cent of the heat has been consumed in the formation of water.

Furthermore, there are certain difficulties connected with the operation of this process. Thus, for example, there is the difficulty of obtaining a good catalyst for the process and, furthermore, the presence of sulphur compounds has a bad effect. This necessitates the careful cooling of the gases, which is also a matter of difficulty. Furthermore, there is supposed to be present in the original gas one volume of carbon monoxide and three volumes of hydrogen, but it is usually necessary to keep the proportion of hydrogen as high as five times that of carbon monoxide, figured on the volumetric basis, in order to avoid the deleterious by-reactions which are apt to take place in the process. Then, again, in water gas the relationship between carbon monoxide and hydrogen is approximately in the ratio of 1 to 1.2. It thus follows that either an additional amount of hydrogen must be added to the mixture or the proportion of carbon monoxide in it must be considerably reduced. Both of these suggestions are theoretically feasible.

Increasing the Hydrogen

It is, of course, possible to generate hydrogen and mix the gas with the aforementioned water gas and thus increase materially its hydrogen content. Then, again, it is possible to treat the water gas itself by passing it in admixture with steam over suitable contact material, carrying out the reaction:

$$CO + H_2O = CO_2 + H_2.$$

The carbon dioxide which results from the decomposition of the carbon monoxide is removed by pressure washing. This process is economical.

But it remains that the conversion of water gas into a mixture of methane and water gas can, however, be possible only with considerable loss of efficiency in the conversion of coke into combustible gases, as compared with the water gas process.

Mixing Coal Gas and Water Gas

Gas works are now making a heating gas and not a lighting gas. The light producing substances, the so-called heavy hydrocarbons, ethylene, benzol, offer no particular advantages as heating ingredients. Due to the fact that they tend to disintegrate with the deposition of carbon black, they are decomposed in the Bunsen burner and converted into heating gas. The efforts that have been made to recover these as valuable materials to wash out the motor benzol and convert the ethylene into alcohol or recover it in some other manner, are steps in the right direction and have been accompanied with some commercial success.

But in the case of the coal gas the heavy hydrocarbons are practically the sole ingredients of the gas which are responisble for its heating value. The mixture of the heating gases themselves has, even in the case of sharply different coal gases, after separation of the heavy hydrocarbons, approximately the same heating value and the same air requirements for combustion and consequently the same combustion conditions.

In the following tabulation there are given three coal gases which were made in regular operations and which have heating values of 5,900, 5,500 and 5,000 calories per cubic meter, respectively.

Characteristics of Gases

	Gas I.		Gas II.		Gas III.
Max. heating val..	5,870	+ 7%	5,470	— 7%	5,070
C(m)H(n)	4.5		3.8		2.0
CH_4	32.6		30.2		28.0
H_2	49.6		51.0		57.0
CO	8.4		9.0		9.0
CO_2	1.9		2.0		2.5
N_2	3.0		4.0		1.5
Max. heating value without C(m)H(n)	4,870	+3.9%	4,705	—0.5%	4,680
Air consumption:					
Original	5.5	+8.0%	5.1	—8 %	4.7
Without C(m)H(n)	4.45	+3.5%	4.3	—1.5%	4.25

Discussion of Table

The difference between the heating values amounts to 400 to 500 calories, the air requirements vary between 5.5 and 4.7 times the volume of the gas. When the heavy hydrocarbons are not taken into consideration, then the heating values of the three gases are scarcely any more than 100 calories apart. Furthermore, the air requirements are also very similar. This is, to be sure, nothing new. But the composition should show that the content of heavy hydrocarbons has no particular advantage from a thermal standpoint, for the value of a gas is determined essentially by its uniformity. The uniformity of the composition of the gas is the property that determines whether or not it is possible accurately to regulate the apparatus in which it is employed so that the conditions surrounding its use are the best possible from an economic and technical standpoint.

Value of Gas from Heating Power Standard

It is also not fundamentally correct to base the quality of a gas entirely on its heating value. This applies only to the application of the fuel for heating purposes. However, in the case of heating furnaces, this is important only for that part of the heat which is transmitted by convection, while for the heat that is transmitted by radiation the flame temperature is determinative. Thus, in cooking, the efficiency of the process is influenced to a greater degree than what is generally assumed, by the length and temperature of the flame. However, when the question is concerned with the attainment of high temperatures, as prevails in most of the application to which gas is put in the industrial and domestic fields, then the importance of the heating value returns and is more significant than the flame temperature and the concentration of the combustion process.

A Table Containing Valuable Information

In the tabulation that follows there are given various data regarding the heating value, the air consumption and particularly the flame temperature of the pure gaseous ingredients, as well as of coal gas and water gas. These figures are calculated from the thermal values and specific heats of the combustion products. Although these temperatures are not attained in practical operations, because the combustion process is not instantaneous and absolutely complete, nevertheless, the figures serve as a measure of the useful heat obtained.

	Maximum heating value, calories per cubic meter	Air consumption in volumes per unit volume of gas	Air consumption in cubic meters per 1,000 calories	Theoretical flame temperature in degrees C.	Maximum speed of ignition in centimeters per second
Hydrogen	2570	2.38	0.92	2225	200
Carbon monoxide	3034	2.38	0.78	2430	31.5

Methane	8562	9.52	1.11	2045	27.5
Ethylene	13939	14.3	1.03	2270	50.5
Benzol	32978	35.9	1.09	2215	
Coal gas, 5700 calories...	5100	5.40	1.05	2090	about 63
Water gas	2540	2.39	0.94	2230	about 135
Producer gas	1135	0.94	0.82	1662	

Discussion of Table Figures

From this tabulation it is easy to see that carbon monoxide is a very valuable gas from the thermal standpoint, while methane, which contains potentially the most heat in the form of chemical energy, has the effect of considerably reducing the effectiveness of the heating process. Then, again, this tabulation shows, what has been known in the welding field, that water gas, although its heating value is one-half of that of some coal gases, nevertheless yields a much higher flame temperature than the latter.

The property which has the most influence in defining the combustion conditions of the process is the rate of flame propagation. However, it is just this property which cannot be determined from a simple chemical analysis of the gas, nor can it be established in the laboratory by simple methods. The rate of flame propagation gives the entire character of the flame of burning gas. It is dependent to a certain extent on the proportion of the combustion air that is mixed with the gas as primary air in the Bunsen burner, for example, and then, again, on the rate of flame propagation of the individual constituents of the gas.

The Pressure of the Gas

This is another point which is of importance in determining what the future gas will be like. The pressure at which the gas is furnished to the gas appliance depends, just as the amount of water vapor that is admixed with the city gas, on the properties and limitations of the appliances themselves. It has been established that the standard pressure of 30 to 60 millimeters, one to three inches, is no longer requisite from a technical standpoint. The use of gas for lighting purposes made it necessary to furnish it to the consumer at a low pressure. However, the heating and particularly the industrial requirements have made it necessary to supply the gas at a much higher pressure. This has, of course, made it necessary to make certain changes in the design of the gas-using apparatus. It is understood that whatever changes are to be made in the construction of gas appliances due to the increase in gas pressure would have to be very gradual.

(In the original article the author goes into some detail to prove that the practice of admixing gas with coal gas is a correct one from an economic standpoint, basing his calculations on the market prices of by-products as well as that of coal, etc.—Trans.)

Conclusion

The best indication of the quality of gas is its uniformity of composition. The gas must be uniform in composition and in properties, not only at the point of manufacture, but, what is more important, at the points where it is employed. It is for this reason that the designing of the apparatus in which gas is employed is perhaps of more significance than that in which the gas is manufactured.

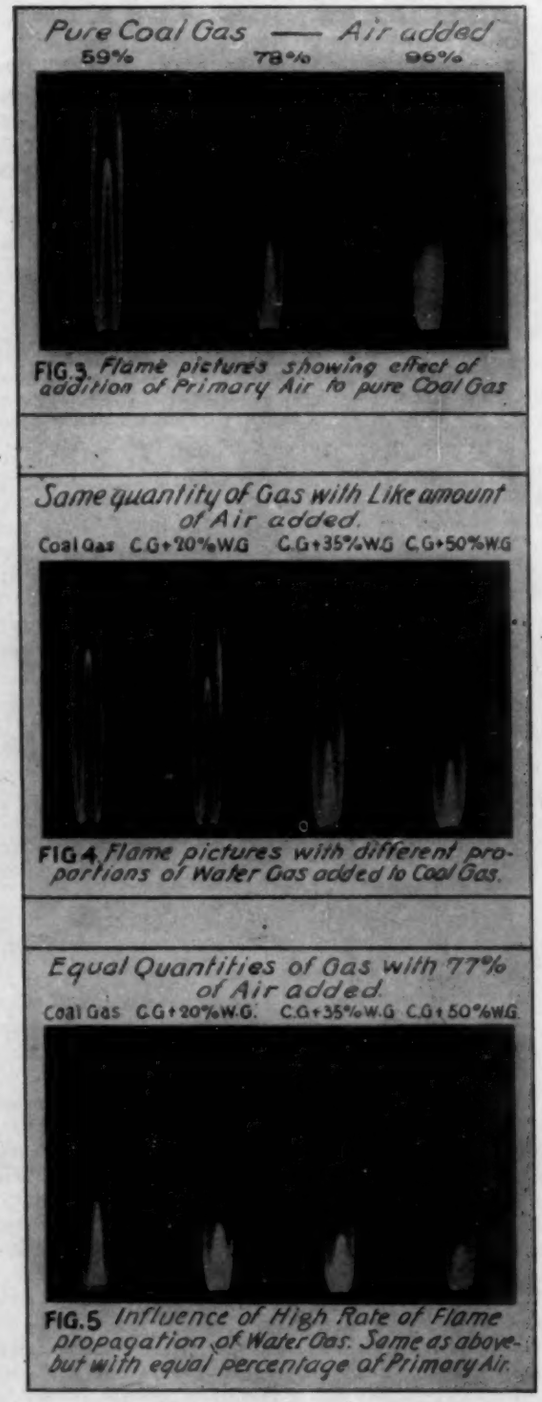


FIG. 3. Flame pictures showing effect of addition of Primary Air to pure Coal Gas.

FIG. 4. Flame pictures with different proportions of Water Gas added to Coal Gas.

FIG. 5. Influence of High Rate of Flame propagation of Water Gas. Same as above but with equal percentage of Primary Air.

Flame Pictures of Burning Gas

It is possible to sum up the important factors which are acting at the present time in shaping the course of gas manufacture and which will be of even greater importance in the future is determining what kind of gas will eventually be manufactured and sold by the gas companies. These important points are as follows:

In the first place the regularity of composition and of properties of the gas must be continuous, and this refers to the heating value, the specific weight and the pressure of gas.

It is considered that the gas manufactured and distributed by a gas company will be about standard if it contains a potential heat value of 4,000 to 4,300 heat units per cubic meter, at standard temperature and pressure, 0 degrees C. and 760 millimeters mercury. This corresponds to 450 to 500 B.t.u. per cubic foot.

This heating value is secured by the addition of combustible gases to coal gas.

The specific weight of the mixed gas should not be more than 0.5.

The gas should be absolutely free from hydrogen sulphide, ammonia and tar.

What the Conditions Signify

These conditions signify that the gas can be made from the admixture of coal gas and water gas in the right proportions, or that the gas can be straight coal gas, provided that the percentage of inert, incombustible matter does not exceed 15 per cent. This, then, means that the small gas works which does not have a water gas set, in addition to a coal gas set, can still manufacture the gas of approved calorific power by careful control of the gasification conditions, so that there is not too great an excess of incombustible matter mixed with the gas.

(In conclusion, the editor wishes to state that this article was followed by an animated discussion at the meeting at which it was read and that there seemed to be considerable divergence of opinion on the matter. It is unfortunate that the discussion cannot be published here for want of space.)

(Continued from page 638)

formation in advance, they are likely during the first winter to lose a good many prospects for the gas company.

Writing the Sales Letters

A few days after the second interview I write the prospect a sales letter, in which I state about the same things I told him in the interview. This particular prospect called me to his office six times before I sold him the boiler. Each time he asked questions relative to the operation, the installation and the service. The advantage of following up the interviews with letters lies in the fact that the prospect has in black and white what has been told him and this tends to give him more confidence in the proposition.

The next step after the heating engineer has sold the boiler is to lay out the plans for the installation of the boiler and the piping. He will be blamed if the installation does not work as he has promised it will and the only way he can be sure it will work is to lay out the plans in detail, showing exactly how it should be installed.

Starting the Boiler

Before starting up the boiler be sure to clean it out to stop any chance of priming from the oil and dirt left in the piping after installation. Also be sure to find the best location for the thermostat. This instrument should not be placed on an outside wall nor too near a radiator.

The number 4-S-3 Bryant boiler which I installed for this customer was set on a cement foundation high enough to make the water levels of the two boilers equal. The steam supply of the gas boiler was run into the main supply of the system just above a valve which was placed in the supply line from the coal boiler.

Between the returns of the two boilers another valve was placed so the coal boiler could be shut off completely. If this man wishes to use his coal boiler at any time all he needs to do to put it into service is to open the two valves and start a fire.

An Important Sales Argument

I have found this idea valuable in my sales talks. With an arrangement like this the prospect does not feel he is entirely dependent upon the gas company. If he finds the cost too high he can run the coal boiler during the coldest weather. As a matter of fact, however, he rarely will start the coal boiler. The gas is too convenient and he keeps putting off firing up with coal, keeping his coal supply in the cellar year after year and never touching it.

At first each new installation should be visited once a week. Later, as the customer becomes more accustomed to it, once a month is generally all that is necessary. The big thing is to get the boiler working properly at the start and if the installation has been made properly this is not a difficult matter. The weekly inspection will soon show whether there is anything wrong, and if there is, these things should be corrected at once. This follow-up work is of even more importance than making the sale, for it is the effectiveness of this work that determines the sales which will be made in the future.

Service After Installation

If a customer telephones something is wrong, answer the call at once. Bear in mind that the customer is very nervous until you arrive. Generally it is some slight trouble you can fix in a very few minutes without calling in a fitter. Fixing it at once makes a good impression and when talking with friends these customers are going to mention the fine service they are getting.

The results of this particular installation have been very good. It was started October 7, 1924, and up

till April 24, 1925, just 200 days, had consumed 390,800 cubic feet of gas at a total cost of $305.77. About 35,000 more cubic feet was burned before the boiler was shut down for the season. This made my estimate only 15,000 cubic feet too small, and $7.50 more than my lowest figure of $315.

Against this he paid $337 for coal and labor last year. This being the case, he is naturally well pleased with the results. He is a satisfied customer and will surely help sell several more boilers. I believe he would cut the cost of operation quite a bit should he add storm windows, for we have found these do reduce the heating cost materially.

What the Customer Has Gained

These are some of the advantages he has gained by using gas. He no longer has to worry about his wife looking after the fire when he is away on a business trip. Though a man was hired to do the firing, he looked at the fire only three times a day, and any attention between these visits had to be given by someone in the house. When there was a party or late callers, the fire had to be raked over and banked again for the night. So, though a man was paid for looking after the fire, there was still a good deal of attention that had to given it by someone in the house. All this trouble, annoyance and labor have been eliminated completely since gas has been used.

Instead of the house being very hot or very cold, it is now held at a uniform temperature of 70 degrees for 17 out of the 24 hours of the day and at 60 degrees during the remaining seven hours. As a result, no one in the house has had a cold all winter. Considering there are two small children in the house, this has meant a material saving in doctor's bills, to say nothing of the greater comfort that has resulted to each member of the family. There is less dirt; which perhaps helps to account for the absence of colds, and which certainly means much less housecleaning.

Conclusion

There is surely an extensive field for gas house heating. This field, however, is among people who can readily afford to pay for the convenience and the comfort it gives them. It is best to be frank with a patron of the gas company and if in your estimation it would be detrimental to the interests of a customer to install a boiler, the wise course is to work just as hard to keep him from putting it in as you would work to sell one to a person who can readily afford it. In this way the road is paved for the greatest possible popularity of gas in the future and a lot of talk about high bills is prevented.

ADVERTISING BUILDS GOOD WILL

(Continued from page 636)

newspapers may realize that that makes a much better picture—especially for newspaper illustrations.

The time is ripe for utility men to use newspaper advertising as a distinct arm of their service. The daily newspaper today exists and thrives by the service it performs. If the service is good, its subscription list is large and its profits are satisfactory. The newspaper is not only a medium of information, but it is a medium of education.

People Turn to Newspaper

People turn to their newspaper just as you turn to a good friend for advice. If you were to canvass the homes in your communities you would find that one or more newspapers went to each home daily. It is these people you must depend on for your revenue as customers. You should be educating these people on better uses for your product. You should be showing them what your service means to them. how it could make life easier for them and make them live more comfortably.

Take the public into your confidence. Tell people frankly your ideas and your ideals. Tell them what you hope to do and how you are planning to do it. If you have made a mistake or been the victim of an accident or inadequate service, come out and tell the people frankly. Tell them why. The public is human and will meet you more than half way. Your customers will condone your mistakes.

Don't expect to put your good will across through the medium of free publicity. It only marks you down and only builds ill will on the newspaper man's part. It accomplishes little or nothing.

Realize that the newspaper man's advertising column is a public service column that he has to sell just as you have to sell your gas or electricity.

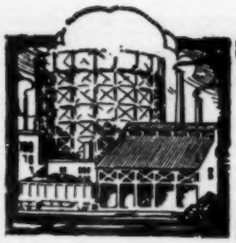
The Newspaper Man's Side

The local newspaper man may hesitate about approaching you. No reputable newspaper man wants to place himself in the position where the utility man may think he is trying to hold him up. In the old days there were plenty of utility men who thought that if they bought advertising space in the newspapers they were also purchasing favorable write-ups and good treatment in the editorial columns. In the modern or more high-class newspapers, the editorial column is not for sale and the news columns are not for sale. The constructive newspaper man is so straight in this respect that he leans backward. He is sometimes so fearful of creating a wrong impression that he does not even approach the utility man to talk advertising. But if he knows that you understand something about what advertising really is and what it will do for you, he will be only too glad to help you.

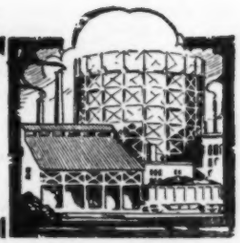
He does not want you to buy advertising unless you can make it pay and he will be very glad to show you the best ways of making it pay.

Old Order Has Changed

The old order has changed. The reputable utility man is no longer a good target for the political blackmailer. Some have so firmly entrenched themselves that they have made their customers stockholders. This customer-stockholder plan is growing. It is a good idea and a healthy one, both for the utility and the country itself. It is death medicine to the demagogue and socialist.



NEWS OF THE GAS INDUSTRY



Pennsylvania Gas Men Hold Mid-Year Meeting

The mid-year meeting of the Pennsylvania Gas Association was held December 7, 1925, at the Hotel Casey, Scranton, Pa. It was one of the best mid-year meetings held by this association in a long time. There were over 165 delegates in attendance.

Wallace G. Murfit, of Newton, Pa., presided, and an address of welcome was made by Worthington Scranton, president of the Hyde Park Gas Company. He was very optimistic regarding the future of the gas industry but, on the other hand, he advised that this business will not jump into our laps. We have got to go out and dig it up, but it is there for every gas company which will go out and make an effort to get it. He stated that it was his belief that more flexibility of rates and B.t.u. standards to meet the needs of the various communities served by gas would go a long way toward smoothing out the road for much additional business by the gas companies. Incidentally, Mr. Scranton is the grandson of the founder of the city of Scranton.

The membership committee reported that the association has taken in 143 new individual members since the last meeting and six gas company members, including the gas company at Elizabethtown, Mt. Joy, Honesdale, Easton and Tamaqua.

The first paper read was by Miss Marian Brainard, of the Luzerne Country Gas and Electric Corporation, of Kingston, Pa., on the subject of "Home Economics." Miss Brainard's paper was really a talk from notes. Her arguments for Home Service departments in every gas company were irrefutable.

Training and Compensating Salesmen

The next paper was read by L. T. White of Buffalo, N. Y., the subject being "Method of Training and Compensating Salesmen in Small Companies." Gas men at this meeting pronounced it the best paper on the subject they had ever listened to and the paper in full, with discussions, will be published in the December 19 issue of The American Gas Journal.

1926 Convention at Atlantic City

New York, N. Y.—The 1926 convention and exhibition of the American Gas Association will be held at Atlantic City, N. J., the week of October 11, according to a statement made here by the Time and Place Committee of the association.

The executive board made a careful investigation of convention facilities of middle western cities and found that no facilities were available now or in 1926 that could house the convention and exhibition on the basis of 1925 requirements. Accordingly, the Time and Place Committee selected Atlantic City for the 1926 meeting and announced that prospects are most favorable for a middle western meeting in 1927.

A. L. Klees, of the Combustion Utilities Corporation, New York, read a paper on "Automatic House Heating."

All the delegates at the convention were the guests of the Scranton Gas Company in the Palm Room of the Casey Hotel. The addresses were made by Mayor Durkan of Scranton and Mr. W. A. Allison of the Pennsylvania Public Service Commission, Harrisburg, Pa.

The gas fraternity will remember Mr. Allison as a prominent gas engineer for many years and his talk was devoted to the executives of gas companies on the matter of their rate schedules.

The meeting was also addressed by the Rev. Samuel Steinmetz of Trenton, N. J.

Other addresses were made by Major J. S. Richardson, director Pennsylvania Public Service Information Committee, Philadelphia, Pa., and Mr. Gordon King of the American Gas Association.

The officers of the Pennsylvania Gas Association are: Wallace G. Murfit, Newtown, Pa., president; R. C. Cornish, Philadelphia, Pa., first vice-president; Joseph Jeffrey, Scranton, Pa., second vice-president; George L. Cullen, Harrisburg, Pa., secretary-treasurer.

Gas Co. Host of Bank Chapter

Providence, R. I.—The Providence Chapter of the American Institute of Banking recently assembled at the Sassafras Point plant of the Providence Gas Company, where dinner was served, followed by an interesting inspection of the gas plant. Arthur F. Short, treasurer, and R. L. Fletcher, engineer of manufacture, acted as hosts during the dinner, after which a short meeting of the chapter was held before adjourning for the plant inspection.

The 150 visitors were divided up into 12 groups and assigned to company guides, who escorted them through the works, explaining the various processes and points of interest.

A. Clarence Ohlson had charge of arrangements for the Providence Chapter, while I. E. Knowlton had charge of arrangements for the gas company. Employees of the gas company acting as guides were Messrs. R. T. Jackson, C. H. Buddenhagen, E. Payne, J. Egan, F. T. Macdonald, W. Shannon, G. Worrall, E. R. Clark, J. M. Donegan, L. R. Phelps, A. H. Meyer and L. E. Knowlton.

Dollar Gas Decision to Aid Other Companies

The decision of the Statutory Court in the litigation of the New York and Richmond Gas Company against Dollar Gas Law has an important bearing on the cases of the Consolidated Gas, Brooklyn Union and other New York City companies. The decision is the strongest yet obtained by local gas companies and rate lawyers for various companies regard the decision as strengthening their hand when the big rate cases come before the United States Supreme Court for final adjudication early in 1926.

Federated Utilities Acquires Huntsville Gas Co.

Huntsville, Ala.—All of the properties, bonds and capital stock of the Huntsville Gas Company have been acquired by the Federated Utilities Company, Inc., of Battle Creek, Mich., according to an announcement just made by the officials of the company.

Claude J. DeMers, who has been general manager of the Huntsville Gas Company since 1920, will remain in charge of the plant, with H. Grady Crunk remaining as general superintendent, and there will be no change of name or in the personnel of the concern, it is announced. The new owners plan extensive enlargements and improvements of the present plant, with an extension of service to provide gas for all of the rapidly developing suburbs of the city and its outlying districts, and the change will be of real benefit to all concerned.

The Federated Utilities Company, of which P. L. Seymour of Georgia is president, has been steadily expanding and acquiring new properties in the South during the past few years, and it is reported that the firm now has investments in the East and Southeast amounting to more than $25,000,000 and controls some of the largest gas plants in the section.

Citizens Gas Co. to Build Sulphate Plant

Contracts have been signed by the Citizens Gas Company for the building of a complete plant for the production of sulphate of ammonia, the cost of which, according to C. L. Kirk, vice-president and general manager of the company, will aggregate approximately $344,000. Of this amount, $294,000 will represent investment in the new plant and $50,000 is the estimated cost of changes in the property.

Construction of the sulphate of ammonia plant was made necessary, Mr. Kirk said, because the recently developed atmospheric nitrogen plants are producing a grade of ammonia at a cost which has destroyed the market for ammonia liquor such as is produced by gas companies as a by-product and which heretofore has been produced and sold by the plants of the Citizens Gas Company. Mr. Kirk explained that ammonia is necessarily produced in the manufacture of gas and the company was compelled to make the new plans to find a market for this by-product.

Used in Refrigerating Plants

The ammonia liquor heretofore produced was sold to the ammonia interests who refined the liquor and put it on the market as anhydrous ammonia for use in refrigerating plants principally and for other general uses.

The recently developed atmospheric nitrogen plants, which have destroyed the market for the crude ammonia liquor produced by the gas companies as by-products of gas production, he said, take nitrogen from the air and mix it with hydrogen, and at less cost produce an ammonia better adapted to refrigerating plants and for general uses.

The new plant, Mr. Kirk said, will manufacture what is known as an agricultural grade of sulphate of ammonia. The product is in crystal form, similar in substance to grain sugar, but gray in color, and contains 21 per cent nitrogen. It is sold to fertilizer producers and is particularly well adapted to soil fertilization, as in the grain form it can be drilled into the soil.

Use Part of Old Building

It is the plan of the gas company to use part of the present by-products building for the new plant installation and to build a new storage building, which will cost from $50,000 to $60,000. The contract provides for the plant to be built within four months. The company will be forced to sell practically all the present crude ammonia liquor plant as scrap, which, Mr. Kirk said, will mean the writing off of approximately $100,000 for the capital account of the company.

Mr. Kirk said the crude ammonia liquor plant at the Langsdale plant of the company will be maintained for the present and the product sold in so far as there is any demand. The remainder will be transferred in tank cars to the Prospect street plant and converted into sulphate of ammonia. It is planned in the new plant to take care of the ammonia liquor of other gas plants and convert it in the same way, so that a market may be found for the by-product. Mr. Kirk said he has learned that the Terre Haute Gas Company also is making the change to a sulphate of ammonia plant.

Utilities Association Elects Officers

James L. Potts of Rawlins was elected president, James J. Withdrow of Sheridan and W. J. Johnson of Casper were named vice-presidents at the annual convention of the Wyoming Utilities Association.

C. E. Wood to Manage Kennett Gas Company

Kennett Square, Pa.—Announcement has been made by the Kennett Gas Company that Charles E. Wood will succeed J. H. Julian as manager of the local company, with offices here and plant at Avondale. Mr. Wood has had considerable experience along this line, having been formerly con-

nected with the Jersey Central Light & Power Company of Belmar. Mr. Wood previously managed properties of the East Pennsylvania Electric Company at Pottsville and the Gary Heat, Light & Water Company of Gary, Ind.

Municipal Gas Co. House Heating Schedule Approved

Albany, N. Y.—The Public Service Commission has given special permission to a new schedule of the Municipal Gas Company of Albany, effective November 27, 1925, for gas service supplied in cities of Albany and Watervliet and village of Green Island and town of Colonie, providing new classification for use of service for fuel for residence heating purposes, furnaces, either steam, hot water or hot air, at rate as follows: For first 10,000 cu. ft. or less per month, $12; for the next 15,000 cu. ft., 80c per thousand cu. ft.; for all over 25,000 cu. ft. per month, 65c per thousand cu. ft. Minimum charge, $12 per month during the heating season, which omits June, July and August.

Long Island Companies Increase Capitalization

Albany, N. Y.—Certificates increasing the capital stock by nearly $10,000,000 in value of six Long Island gas companies were filed in the office of the Secretary of State recently. Richmond Hill and Queens County Gas Light Company, Brooklyn, increased its capital from $250,000 to $500,000; the Flatbush Gas Company, Flatbush, increased its capital from $200,000 to $1,500,000; the Jamaica Gas Light Company, Brooklyn, recorded an increase from $200,000 to $1,000,000; the Newtown Gas Company, Brooklyn, increased its capital from $60,000 to $2,000,000; the Woodhaven Gas Light Company, Brooklyn, increased its capital from $20,000 to $1,500,000, while the Brooklyn Union Gas Company authorized an increase of the number of shares of its capital stock from 600,000 to 1,000,000 shares, non par value. Increases in each case were filed through the offices of the respective companies.

Potter Gas Company Sold

Corning, N. Y.—The Potter Gas Company, which supplies the Crystal City Gas Company of this city with natural gas, has been sold to a New York City concern. The report of the sale has been confirmed by Frank French, district manager of the company at Coudersport, Pa.

According to the story from Coudersport, the stock holding, as well as those of the Dempseyton Company, have been sold for $2,600,000 cash, the proceeds to be used for calling and retiring a like number of 8 per cent bonds. This will reduce the outstanding bonds to a nominal amount, it is said, which it is the intention to retire by January 1.

Massachusetts Gas Buys Three Coal Companies

The Massachusetts Gas Company, through its subsidiary, the New England Fuel and Transportation Company, has purchased Castner, Curran & Bullitt, Inc., coal distributors of No. 1 Broadway, E. E. White Coal Company and the P. M. Snyder interests. The latter two are soft coal mining companies in West Virginia. The consideration is understood to have been between $10,000,000 and $15,000,000. The purchaser will take control January 1.

New Rates for Utica Gas and Electric Company

Albany, N. Y.—The Public Service Commission has approved a new schedule of the Utica Gas and Electric Company, filed to become effective December 14, 1925, providing for service in the new Sauquoit Valley district, which includes the hamlets of Washington Mills, Willowvale and Chadwicks and the town of New Hartford (Oneida County) except that portion included in the Utica district. Rates, per cu. ft., for use of service for all purposes are: First 100 cu. ft., 65c; next 1,900 cu. ft., 14.5c; next 3,000 cu. ft., 14c; next 5,000 cu. ft., 13.5c; next 15,000 cu. ft., 13c; next 75,000 cu. ft., 12.5c; next 150,000 cu. ft., 12c; next 250,000 cu. ft., 11c; all over 500,000 cu. ft. per month, 10.5c; minimum charge, $1 per month; discount for prompt payment, 1c per 100 cu. ft. Straight line rate of $1.05 per thousand cu. ft. is available to all consumers having a minimum demand of 50 cu. ft. per hour and who guarantee use of 10,000 cu. ft. per month. Minimum monthly charge during first year will be determined by the maximum demand in any one month of that year and thereafter will be determined by the maximum demand which has occurred during the previous 12 months ended with the current month, computed on the following basis: First 50 cu. ft. of hourly demand, $4.70 per 100 cu. ft.; next 450 cu. ft. of hourly demand, $3.70 per 100 cu. ft.; next 500 cu. ft. of hourly demand, $3.20 per 100 cu. ft.; over 1,000 cu. ft. of hourly demand, $2.60 per 100 cu. ft. plus 10,000 cu. ft. at $1 per thousand cu. ft.

Flexible Gas Income Plan Is Approved

Ann Arbor, Mich.—Revision in the sliding or flexible gas revenue schedule contract between the Washtenaw Gas Company and the customer, increase in the company's valuation and a raise in the guaranteed return on the investment to a flat rate of 6 per cent, as recommended in a special gas committee report, have been adopted unanimously by the City Council.

Under the revised 20-year franchise which was granted to the gas company January 1, 1918, the valuation of all properties is placed at $1,238,720.67, on which the company will receive a 6 per cent guarantee. The valuation asked for by the company from the utilities commission was slightly under $1,700,000. The figure finally decided on by the gas company and the special committee is $150,000 more

than the value of all properties as shown in the company's books.

It was only after weeks of study of the problem that this committee was able to complete its report and make the following recommendations, which were adopted by the Council:

That the guaranteed rate to the company be fixed at 6 per cent and taken upon the agreed value of the company's physical property, including going concern, plus additions to the properties during the current year and less retirement of the properties during the current year.

That the amount used for materials and supplies shall be the total of this item at the end of the current year as shown by the audit of the company's books, excluding, however, gas coal, stock, gas oil and purifying materials.

That the working capital for any year shall be taken at 5 per cent of the value of the physical properties for that year; that the capital additions made to the property shall be taken at the actual cost thereof plus the proper allowance for interest during construction, injuries, damages, etc., as approved by the Michigan Public Utilities Commission.

That moneys held by the company from uncalled for customers' shares of the profits, customers' shares set aside for those customers living outside of Ann Arbor, but not in the Chelsea zone, shall after setting aside from the amount a reasonable reserve for bad debts and uncollectable bills, be credited to and treated as miscellaneous income.

That from the amount in this fund now on hand the company shall be reimbursed to the amount of $5,845.88, being the amount by which the company has been underpaid in the application of the rate plan since 1921, through no fault of the company.

That the agreed valuation of the company's physical property of January 1, 1925, is $1,238,720.67; the value at the end of the year hereafter will be the above amount plus capital additions made in succeeding years.

The sliding scale of division of surplus between the company and the customers provides that the customers' return on the net income shall start at 10 per cent on a primary rate of $1.10 and will increase 10 per cent for each 5 cents added to the primary rate, up to $1.55, when the customer receives a net return of 100 per cent of the net income.

Consumers Power Buys Grand Ledge Gas Co. Property

Grand Rapids, Mich.—In accordance with its program of expansion the Consumers Power Co. has purchased from Seymour W. Cheney the property of the New Grand Ledge Gas Co., which the local man has owned and managed for the past year. The Grand Ledge property is said to have a replacement value of between $60,000 and $65,000.

This purchase is a step on the part of the Consumers Power Co. in expanding its service from Lansing and will result in abandonment of the generating plant at Grand Ledge, probably in the spring, and installation of a trunk gas main to Grand Ledge with service to farmers along the route.

It also is planned to run a similar line to Mason, furnishing farmers and residents of Holt with service in the eventual carrying out of the plan.

The Consumers Power Co. will gain possession of the works December 1.

The Grand Ledge plant was established in 1905 by a group of citizens and operated by them until 1919, when it went into the hands of a receiver. The next year it was purchased by R. A. Latting, Grand Ledge attorney, who operated it until the latter part of 1924, when it was taken over by Mr. Cheney.

Seymour W. Cheney has been a resident of Grand Rapids for the past 12 years. On coming here he was associated with the American Public Utilities Co. Eight years ago he became chief engineer of the Grand Rapids Gas Light Co. plant and for the past two years has been a consulting engineer.

Gas Company Has Confidence of Citizens

Houston, Texas. — Furnishing gas to 30,200 meters through an aggregate of 346 miles of mains, the Houston Gas and Fuel Company is a home-grown institution of which all Houstonians feel proud. This pride was rather strikingly demonstrated last January, when a $500,000 issue of preferred stock, offered only to Houstonians, was over-subscribed in 36 hours.

Officials of the company believe, too, that this ready response to the company's stock offering indicates that the officers of the utility have succeeded in winning the public confidence.

The time when a public utility stood aloof from the people, wringing what it could from them in the way of charges, and caring little whether or not it served them, is past, officials of the company say. Today more than ever before there must be a warm, human bond between utility and public, and it must be based on a spirit of genuine helpfulness, they believe.

The Houston Gas and Fuel Company has long been an integral part of Houston. It had its origin in the Houston Gas and Light Company, founded in 1866, and at that time Houston had the distinction of being one of the first cities to adopt gas. That year, too, was but one year after gas had become practical for lighting.

T. W. House First President

T. W. House was the first president and later was succeeded by his son. Then, in 1907, Captain James A. Baker was elected to that office and holds it today. Captain Baker had been with the company for a period of 17 years prior to his election to the presidency, giving him in all a total of 35 years service with the Houston Gas and Fuel Company.